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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/060,826	02/01/2002	Daniel S. Pickard	IB-1581	9952

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EXAMINER

LEE, WILSON

ART UNIT PAPER NUMBER

2821

DATE MAILED: 03/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/060,826

Applicant(s)

PICKARD ET AL.

Examiner

Wilson Lee

Art Unit

2821

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) /
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Remarks

Applicant elected group I with traverse. The argument is found persuasive. Thus, the restriction requirement is withdrawn. All claims (claims 1-20) are examined in this office action.

Claim Rejections – 35 U.S.C. 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 18-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding Claim 18, line 2, "multicusp" is misspelled and is not understandable.

Claims 19-20 are not clear by virtue of their dependency on claim 18.

Claim Rejections – 35 U.S.C. 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 6, 11-14, 16, 18, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Patrick et al. (5,578,165).

Regarding Claim 1, Patrick discloses a matching network (See Figure 3) for coupling an RF supply to an RF antenna (20) in a plasma generator comprising:

- a resonantly tunable circuit (34) formed of a variable capacitor (44) and an inductor (36) in a series resonance configuration;
- a ferrite core transformer (e.g. transformer between 36 and 38) coupled to the resonantly tunable circuit.

Regarding Claim 2, Patrick discloses that the transformer comprises a secondary winding (38) which couples the transformer to the tunable circuit and a primary winding (36) (See Figure 3).

Regarding Claim 3, Patrick discloses that the secondary winding (38) is a single turn winding and the primary winding (36) is a multi-turn winding (See Figure 3).

Regarding Claim 6, Patrick discloses that the turn ratio between the primary winding and the secondary winding ranges being 4:1 (See Figure 3).

Regarding Claim 11, Patrick discloses a RF power supply (30) connected through a 50 Ω coaxial cable (See Col. 5, lines 47-55) to an input of the matching network and an RF antenna (20) connected to an output of the matching network.

Regarding Claim 12, Patrick discloses a plasma ion or electron source (See Figure 3) comprising:

- an RF power supply (30);
- a coaxial cable connected to the RF power supply (30);
- a matching network (34) having an input connected to the coaxial cable (32), the matching network comprising: a resonantly tunable circuit formed of a variable capacitor (44) and an inductor (36) in a series resonance configuration; a ferrite core transformer (e.g. transformer between 36 and 38) coupled to the resonantly

tunable circuit; an RF antenna connected to an output of the matching network (34), a plasma ion or electron generator having the RF antenna mounted therein for inductively generating a plasma (See Col. 2, line 59).

Regarding Claim 13, Patrick discloses that the transformer comprises a secondary winding (38) which couples the transformer to the tunable circuit and a primary winding (36) (See Figure 3).

Regarding Claim 14, Patrick discloses that the secondary winding (38) is a single turn winding and the primary winding (36) is a multi-turn winding (See Figure 3).

Regarding Claim 16, Patrick discloses that the turn ratio between the primary winding and the secondary winding ranges being 4:1 (See Figure 3).

Regarding Claims 18 and 19, Patrick discloses that a plasma ion or electron generator of an ion beam (electron beam) system (Col. 2, lines 1-26).

Claim Rejections – 35 U.S.C. 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4, 5, 7-10, 15, 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patrick et al. (5,578,165).

Regarding Claims 4, 5, 15, Patrick, as discussed above, essentially discloses the claimed invention but fails to explicitly disclose that the transformer comprises a core which is made of a plurality of ferrite cores. However, it would have been obvious to

one of ordinary skill in the art to provide a plurality of ferrite cores in Patrick to regulate the magnetic field in order to attain a desired voltage output. It is held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. vs Bemis Co.*, 193 USPQ 8.

Regarding Claims 7, 17, Patrick discloses that the matching networks adjusts coils to *match* with the impedance of the coaxial cable but fails to explicitly disclose that turn ratio is selected to transform the plasma impedance of plasma generator to 50 Ω . However, it would have been obvious to one of ordinary skill in the art that the ratio is selected to transform the plasma impedance of plasma generator to 50 Ω in order to efficiently render the plasma energy from the RF source. It is held that the provision of adjustability, where needed, involves only routine skill in the art. *In re Stevens*, 101 USPQ 284 (CCPA 1954).

Regarding Claim 8, Patrick, as discussed above, essentially discloses the claimed invention but fails to explicitly disclose that the transformer comprises a core being made of 12 ferrite cores with 1.25 inch OD and 0.75 inch ID, being made of M-type ferrite. However, it would have been obvious to one of ordinary skill in the art to utilize any number of commercial available ferrite cores with specific dimension in Patrick to match with the source and load in order to attain desired voltage output. It is held to be within the general skill of a worker in the art to select a known commercial material and type of a device on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding Claim 9, Patrick discloses a variable capacitor (44) but does not disclose the capacitor having capacity range of 5-125pF. However, it would have been obvious to one of ordinary skill in the art to tune the capacitance of the capacitor to any desired range in order to attain desired output. It is held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 220 F. 2d 454, 105 USPQ 233, 235 (CCPA 1955).

Regarding Claims 10 and 20, Patrick, as discussed above, essentially discloses the claimed invention but fails to disclose that the matching network fits within a cylindrical cavity 6 inches in diameter and 8 inches long. However, it would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1955).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pu et al. (6,273,022) discloses a distributed inductively-coupled plasma source. Glavish (5,504,341) discloses an ion implantation system for producing RF electric fields.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Wilson Lee whose telephone number is (703) 306-3426.

Art Unit: 2821

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center receptionist whose telephone number is (703) 308-0956.

Papers related to Technology Center 2800 applications may be submitted to Technology Center 2800 by facsimile transmission. Any transmission not to be considered an official response must be clearly marked "DRAFT". The Technology Center Fax Center number is (703) 308-7722 or (703) 308-7724.

A handwritten signature in black ink, appearing to read "Wilson Lee", is written over a horizontal line.

Wilson Lee
Patent Examiner
U.S. Patent & Trademark Office

WL
3/4/03